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# AGRICULTURE *in* ALBERTA

**Alberta**  
AGRICULTURE

Agdex 000-25



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# PART 1: AN OVERVIEW

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## Agriculture's Place in the Alberta Economy

**L**ittle more than a century ago, Canada was a new nation. Pockets of settlement dotted that part of the great Northwest now known as the Province of Alberta, but for the most part the region remained what it had been since the glaciers departed: unbroken prairie to the south and east, rolling parkland dotted with trees and lakes across the central part, and in the north and west, thickly forested expanses.

During the last part of the nineteenth century, the young nation began to open the Prairies to settlement — primarily to tap the vast agricultural potential of the area. In the total span of human history one century is a very short time, but in that period the prairie sod has been turned and forested areas cleared. Dots on a railway map became villages and towns, and some of the towns became cities, all largely a result of the prosperous agriculturally based economy. Today about 58,000 farms occupy 51 million acres (21 million hectares) of farm land. Those farms, and the processing and service industries that accompany them, make agriculture the second most important area of economic activity in Alberta (after the oil and natural gas industry). And because agriculture is a renewable resource which, if cared for by present generations, will thrive indefinitely, it is a primary source of the province's economic well-being and stability.

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**Farm Cash Receipts** There are many ways of measuring the size and importance of an industry to the economy of a region. Speaking in terms of cash receipts to farmers from the sale of their commodities, agriculture was a \$4.4 billion industry in 1988. The industry that processes these primary agricultural products generates another \$4.6 billion in sales. Another measure is the amount agriculture contributes to export trade. In 1988 farm products from Alberta worth \$2.4 billion were shipped to all parts of the world — about one-fifth of all Canadian agricultural exports. In 1986 Albertans working directly in agriculture totalled 87,300. By comparison, all manufacturing employed 69,800, and primary industries other than agriculture employed 89,000. In order to employ those 87,300 people, generate those \$4.4 billion in sales and provide the basis for a processing industry of equal sales requires a huge investment in land, buildings and equipment. In 1986 that investment in Alberta farms amounted to \$28.623 billion.



## Related Activities

So far we have spoken mainly of the agricultural industry as that involved with the direct production of primary goods: grains, livestock, poultry, vegetables, forages, honey, dairy products. But any industry of significant size in a region has a “ripple effect” — it produces other economic activity because of its presence. The “value-added activity” associated with agriculture — the further processing of raw farm products — is the most obvious direct outgrowth of the industry. However, there is another whole category of activity that serves agriculture: transportation and communication; the production, wholesaling and retailing of the items farmers buy, and of the products they sell; financial services; professionals such as lawyers, accountants and veterinarians; and finally, the public services such as roads, snow removal, product inspection and education that are necessary to the proper function of the industry. All this adds up to a province where many people’s lives are directly affected by the health of agriculture.

Alberta has one of the most balanced agricultural economies in Canada. On average, receipts from livestock approximately equal receipts from crop production (in 1988, \$2.192 billion for crops and \$2.317 billion for livestock and livestock products). Within the livestock and crop segments, there is wide diversity. Beef cattle, dairy cattle, hogs, sheep and poultry are to be found on farms throughout the province. Wheat, barley, oats, rye, flax, canola and numerous varieties of forage crops are grown.

*The “value-added” activity associated with agriculture — the further processing of raw farm products — is the most obvious outgrowth of the industry.*





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The effect of this diversity is important both for individual farmers and the economy as a whole. The overall economic health of an industry depends on the cost of producing the product, the amount produced, the demand for the product, and therefore the price obtained for it. Because of the many factors influencing agricultural production, from climate and weather to government policy, and the global nature of the market for many of the commodities, agriculture is particularly prone to fluctuations in the production and profitability of its products. Farmers who do not depend on just one commodity for their income can weather the inevitable swings in income that occur with single commodity markets. Similarly, regions in which there is varied agricultural production experience a more even, stable overall economic climate, rarely experiencing poor markets for all products simultaneously.

Alberta's farmers are efficient. With just nine per cent of Canada's population, Alberta regularly produces around 20 per cent of Canada's agricultural output. The fact that total output from Alberta farms far exceeds what Albertans consume, leaving a surplus which is exported to many countries throughout the world, also has a positive effect on the Canadian economy as a whole. Because of Canada's small population it has always relied heavily on export markets for its goods. It is important for Canada to maintain a healthy export trade so that Canadians can afford imported goods. Wheat has been the traditional agricultural export of the Prairies, but in addition, the region exports significant quantities of barley, canola (rapeseed), and cattle, as well as lesser-known products such as honey, dehydrated alfalfa, and breeding livestock and genetic materials such as frozen cattle embryos. In 1988, for example, wheat and wheat flour exports from the province totalled \$1,072 million; barley \$143 million; other cereals \$67 million; canola \$230 million; meat, fresh, chilled or frozen \$146 million.

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## Agricultural Processing

Agri-food processing is an integral part of the Alberta economy. Next to petroleum products, food and beverage processing constitute the largest manufacturing industry in Alberta. In 1988 the value of shipments by food and beverage processors amounted to \$4.6 billion, or just over one-quarter of the total value of manufacturing shipments. Presently, Alberta's food and beverage industry is composed of 320 establishments of which about 295 are involved in food processing and 25 in beverage processing.

The meat and poultry processing industry is by far the largest sector both in terms of employment and value of sales. In 1986 these firms, ranging from small abattoirs to modern multi-million dollar high-volume facilities, shipped \$1.918 billion worth of meat and poultry products. Total value of Alberta dairy products in 1988 was \$519 million. Other large areas of processing activity are in grain products ranging from breakfast cereals to cookies (\$105 million in 1986), bakery products (\$102 million in 1986) and feeds for animals (\$285 million in 1986). The trend in food processing in some sectors such as dairy, meat and honey has been toward fewer, larger, more efficient establishments generating a greater volume and greater value of production. But there is also a trend towards the establishment of a variety of smaller specialty food processors.



## Farm Productivity

Down on the farm as well, the trend has been toward larger operations involving greater investments in land, buildings and equipment. Farm size has steadily increased for several decades, as has the average capital investment in each farm. There has been a corresponding decrease in numbers of farms: in 1951 there were 84,315 farms; by 1986 there were 57,777. Technological advances have been a major factor influencing this trend. Mechanized farming and modern methods such as the use of chemical fertilizers and pesticides have enabled one person to do much more work and produce much more than has ever been possible. At the same time, these machines and materials are very costly and only a large-scale operation makes their purchase feasible. Meanwhile the productivity of each unit has risen substantially, especially in terms of the number of people required to keep a farm unit operating. Currently farmers make up only 2.4 per cent of the province's population. Along with increased farm size there has been a dramatic increase in sales per farm. In 1970, only 3.6 per cent of farms reported sales of \$50,000 or more. By 1985 that figure had risen to 37.9 per cent. Even correcting for the effects of inflation (one 1985 dollar was worth only 32 cents in 1970 terms) this represents an increase. The category including farms having sales greater than \$250,000 comprised 2.9 per cent in 1980 and 4.9 per cent in 1985.

This increase in farm sales has, of course, meant that a larger amount of money circulates within the Alberta economy — and is particularly noticeable in rural areas — because of farmers' spending on goods and services. For example, in 1988 farmers spent \$2.86 billion on goods and services including rent, wages and taxes. They paid out \$69 million in taxes and \$272 million in wages. They also paid \$434 million in interest charges to service the debt on their land, buildings, equipment and other purchases. Agriculture is also a major consumer within the province: farmers spent \$490 million on total machinery expenses, \$252 million on fertilizer and lime and \$97 million for repairs on buildings and fences in 1988.



## The History of Agriculture in Alberta

**H**ow did agriculture become the industry just described, in such a new land and in such a relatively short time? The first white man to cultivate the soil in what is now Alberta was Peter Pond, a fur trader who established an isolated post near Lake Athabasca. In 1779 he was raising vegetables in his small garden. More than half a century later, in 1857, the explorer Captain John Palliser travelled the southern Prairies and pronounced the land and climate unsuitable for agriculture. Soon after that, settlers began to move into the area and Palliser's contention was disproven.

But it was more than 100 years between Peter Pond's garden and any large-scale attempts at agriculture in what was then the Northwest Territories. Ranchers began to move into the southern areas between 1874 and 1880, mainly from similar country south of the American border. They found abundant grasses and a climate moderated by occasional Chinook winds in the winter, which made year-round grazing possible. Civilization in the form of the Northwest Mounted Police arrived when Fort Macleod was established in 1874. Surveyors had been working since 1871 on the mammoth task of dividing the Prairies into a grid system of townships (six miles by six miles), sections (one mile square) and quarter sections, in preparation for the allotment of the unbroken prairie to homesteaders.

*A rancher's home near Vegreville, 1904. Between 1901 and 1905, 40,000 homesteaders were given free hold title to their land in exchange for paying \$10, agreeing to stay on this land for at least three years, breaking a certain amount of land each year and building a house.*



Provincial Archives of Alberta:  
Brown Collection B2645





*A homesteader breaking prairie near Lloydminster, about 1900.*

**Settlement** It was not until the Canadian Pacific Railway reached the area in 1883 that settlement of any consequence began. By the 1890s a tide of immigration into the West was underway, peaking just prior to the outbreak of the First World War. Between 1901 and 1905, 40,000 homesteads were granted in what in 1905 became the province of Alberta. Homesteaders were given freehold title to their land in exchange for paying \$10, agreeing to stay on the land at least three years, breaking a certain amount of land each year and building a house. The settlers came mainly from Europe (especially northern, central and eastern Europe and the British Isles). Some also moved from the eastern provinces and northward from the United States, where virtually all good potential farmland had already been opened up by settlers.

The early homesteaders relied on wheat as their main crop. In 1907 a new breed of early-maturing wheat, Marquis, was developed to replace the later-maturing Red Fife. Even so, drought, frosts, diseases and pests frequently caused crop failures. Farmers discovered they were better off diversifying, and mixed farms raising dairy cows, hogs and poultry as well as field crops became common. Animal populations on farms tended to fluctuate, rising when grain prices were low.



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Although farming communities on the Prairies were in their formative stages, some of the mechanical revolution that was so quickly and profoundly changing the Western World was being felt in Alberta. Huge, clumsy steam tractors pulling multiple-bladed ploughs had broken some of the Prairie land starting about the turn of the century. Steam threshers, owned by custom operators and moved from farm to farm, saw their greatest use in the first two decades of the century.

By the time the 1920s arrived, general optimism about agriculture reigned. What had been the new frontier just a few short years earlier was rapidly developing into a productive agricultural area. The first irrigation projects in southern Alberta had been completed early in the century, and by the 1920s irrigation was widespread. Mechanization of farming was taking hold. The increased demand for food and the manpower shortage caused by the First World War, combined with the availability of new, lighter gasoline tractors, brought the steam era to a close and gave mechanized draft power a permanent place. Farmers were rapidly adopting automobiles for their personal transportation. The earliest recognizable versions of modern implements were appearing on farm fields. Immigration was still filling up the areas not yet cleared and broken. Farmers had formed their own co-operative organizations for marketing their grain, and were such a potent force politically in an area with a predominantly rural population that they formed a political party which ran the provincial government in the 1920s.

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## The Depression

But then came what is still known on the Prairies as the “Dirty Thirties”. The Western Canadian economy was hit by the general Depression that followed the 1929 stock market collapse, by the resulting low commodity prices, and by a drought that caused crop failure after crop failure. Summerfallowing, the practice of letting land lie fallow for a summer and cultivating to control weeds, had been introduced in the 1880s to conserve moisture. The dry, improperly tilled soils drifted badly. Grasshopper plagues were common. Many farmers were forced off the land, to join thousands of other destitute people across the continent.

One result of the drought was the development of improved methods of soil conservation — strip farming, the planting of shelterbelts to break the wind’s force, and new methods of cultivation conserving a protective layer of plant material on the surface of the soil.

As the 1930s drew to a close, the drought ended and the Second World War broke out, restoring prosperity to Alberta farms. Once again, farm products were in demand, especially livestock. Bacon was an especially popular item and the swine industry expanded dramatically.



*Since the war, farming has become more specialized, farm units larger and the investment required correspondingly greater.*



## Moving into the Modern Era

The process of mechanization resumed full-tilt with the labor shortage, strong demand and vastly increased industrial capability that accompanied the war. The tractor replaced

the horse forever and the threshing crew gave way to the swather and combine, which could reduce harvesting to a two-person operation. Government funding was applied to the expansion of irrigation in the South. Locally-based organizations, which had begun springing up throughout rural Alberta during the 1930s, continued to install telephones in rural homes. Similar farmer-owned companies were spreading a network of electrical power lines. After the war one-room schoolhouses were slowly replaced with modern centralized schools to which students were transported by schoolbus.

Since the war, farming has become more specialized, farm units larger and the investment required correspondingly greater. A single piece of farm equipment such as a combine today can cost more than \$100,000 while such other necessary farm inputs as fertilizer, weed control chemicals and fuels can add thousands of dollars to a farmer's bills. Farmers tend to be better educated than their homesteading forebears, often with specialized agricultural education from one of the province's three agricultural colleges or the Faculty of Agriculture at the University of Alberta. Such "high technology" innovations as automated feeding systems, embryo transplantation in livestock, electronic monitoring devices on farm equipment, and micro-computers are also finding their way onto the farms. Farm families are no longer isolated. The automobile, telephone, radio, television and now the satellite dish have ensured that farmers have access to education, health care, communications, consumer goods and services at a level comparable to city dwellers.



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## The Land Base

**A**lthough the people and the farms they have built have made agriculture into the modern, efficient industry it is today, the amazing advances of the past century would not have been possible without a good basis with which to work: the land itself. About 30 per cent of Alberta's total land area is used in crop and livestock production. The 50 million acres used for agricultural production consist of approximately 31 million acres of improved land and 19 million acres of unimproved land. Although improved farm land comprises only 20 per cent of the province's total land area, it represents more than one-quarter of all of Canada's improved land acreage.

The majority of the improved acreage is used for the production of field crops: cereal grains, oilseeds, forage crops and others. The remainder is either improved pasture (pasture which has been seeded with tame grass, fertilized, drained or otherwise enhanced) or summerfallow. The unimproved land in the province is the basic resource for an extensive cattle industry. The native growth, with careful management, is capable of supporting cattle herds indefinitely.

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## Soil Zones

The province of Alberta is divided into five major soil zones, Brown, Dark Brown, Black, Dark Gray and Gray. The Black soil zone lies in a narrow, north-south belt from Edmonton to Calgary and along the foothills to the Montana border. These soils constitute only 16 per cent of all soils in Alberta. However, because of favorable moisture conditions and high organic matter, they account for one-third of the land used for agriculture in the province.

South and east of this band lie the Dark Brown and Brown soil zones. Moisture is a major limiting factor to crop growth in both zones. Each of these constitutes about one-tenth of Alberta's soils but account for up to 40 per cent of the land base in Alberta used for agriculture.

The Dark Gray soils lie north and west of the Black soil zone and are also present in the Peace River block. A cool climate results in a limited growing season for annual crops. These soils make up 10 per cent of the province's total soils but comprise a larger percentage of agricultural land. By far the largest area is covered by Gray Wooded soils (52 per cent), although these soils support less than one-tenth of all agricultural activities. They cover almost the entire northern and west-central portion of the province. Most Gray Wooded soils are severely limited by a short growing season.

Another method of classifying soils, the Canada Land Inventory system, provides a rating of the agricultural production capability in terms of climate, soil and/or landscape limitations and the degree of those limitations. The first four of seven classes are considered arable (capable of producing cultivated crops), although Class 4 is marginal. Classes 1 to 3 constitute 17 per cent of the province's soils. Adding Class 4 land, a total of 32 per cent of the province is capable of producing cultivated crops. CLI Class 5 lands, accounting for 17 per cent, are capable of improved forage crop production.



## Production Capability of the Agricultural Land Base

The agricultural land base is finite and care needs to be taken to protect and conserve it. The increase in Alberta's population since the 1960's led to the conversion of agricultural land to urban and industrial uses. This has reduced the number of acres of prime agricultural land available for production. Degradation by wind and water erosion and by salinization have also contributed to a concern for the agricultural land base. Efforts are being made to counteract and rehabilitate affected areas through soil conservation practices. Reclamation of land disturbed by oil and gas well sites, pipelines and coal mines is also required.

The productivity of many agricultural lands can be significantly increased through more intensive land management and advanced technology. Examples include: drainage, liming acid soils, range improvement and irrigation. The potential also exists for opening new lands into the frontier areas of the province. These lands, however, are predominantly Canada Land Inventory Class 4 with lower capability for cultivated crop production. The potential to increase production through intensification and expansion of the agricultural land base do, however, provide a secure future for the agricultural industry in Alberta.

## Irrigation

Irrigation is one of the primary methods of improving agricultural productivity and diversifying the range of crops grown in the warmer, arid regions of the province. Irrigation is continuing to expand beyond the 1.17 million acres currently serviced by the 13 irrigation districts in southern Alberta. Today, crops produced under irrigation account for about 12 per cent of Alberta's agricultural production, even though irrigated land constitutes only four per cent of the total cultivated acreage. Irrigation enables the growing of crops such as sugar beets and soft spring wheat which could not survive on the amount of moisture available on Alberta's dryland farms; it also greatly increases yields over what could be expected without the additional moisture.

*Today, crops produced under irrigation account for about 12 per cent of Alberta's Agricultural production, even though irrigated land constitutes only four per cent of the total cultivated acreage.*





*Agricultural soils are too valuable to let this happen again. Today's farmers can't afford to let up on the use of conservation management practices.*



**Conservation** In recent years there has also been a reawakening of concern, reminiscent of the conservation advances of the 1930s, for preserving the quality of the soil. Old conservation management practices including reduced tillage are being encouraged and the traditional farming methods such as summerfallowing are being re-examined. It is now known that the practice of summerfallowing may cause a net loss in fertility, organic matter content and soil quality, and that in all but the driest areas of the province the moisture saved is not enough to outweigh the harmful effects of the practice. Because of the importance of organic matter content in maintaining the soil's tilth, fertility and resistance to erosion, new methods emphasize maintaining or building up the organic matter, which has accumulated in the soil over thousands of years but which can be depleted rapidly with improper practices. Other conservation efforts are aimed at controlling the spread of salinity, which may result from improper cropping practices, including summerfallowing, and which can reduce crop yields on previously fertile soil. A third area of emphasis is on the prevention of wind and water erosion. Most of the erosion can be controlled by maintaining an adequate amount of protective crop residue cover. As the years go by, more is also being learned about how to make the most out of the fragile and often not very fertile soils of the Gray Wooded zone. Emphasis here is on the development of crops and crop rotations that maintain or improve the fertility of the soil while providing adequate income to the farmer.

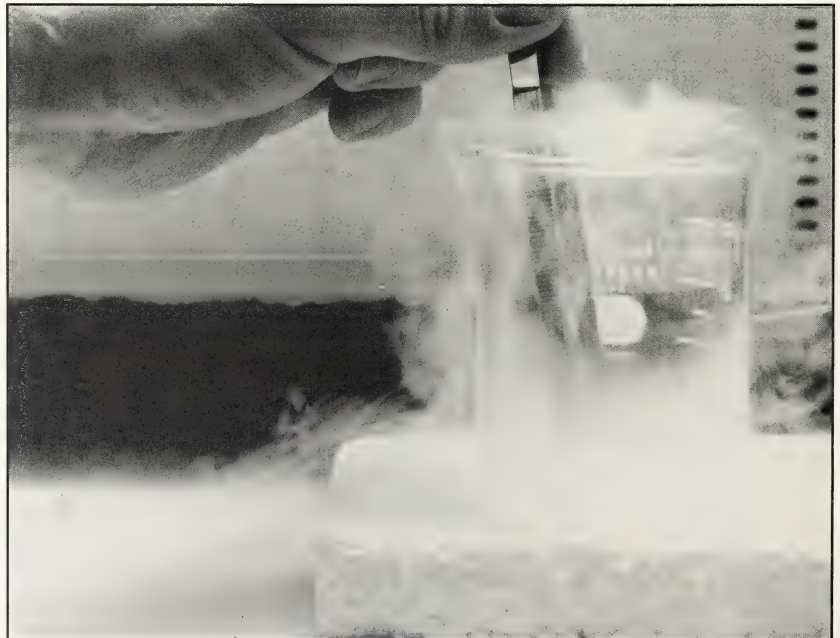


## Agricultural Research

**T**he search for improved understanding of physical and biological processes, for better varieties of crops and breeds of livestock, and for improved methods of producing and processing agricultural products, is an international undertaking. Alberta's agriculture industry has benefited from the advances made elsewhere, but it has also contributed to the advancement of agricultural research through activities conducted here.

The great majority of agricultural research in the province is conducted by public institutions and financed by public monies, largely from federal and provincial governments. In recent years, however, there has been more activity in the private sector, often supported in part by public funds from the Farming for the Future program and the Alberta Agricultural Research Institute. Agriculture Canada, the Canadian government's agriculture ministry, maintains research facilities in Alberta at Lethbridge, Lacombe, Beaverlodge and Fort Vermilion. The provincial government supports research at various locations: field crops research at Lacombe, special crops and horticultural research at Brooks, environmental studies at Vegreville, irrigation and special crops research at Lethbridge and food processing research at Leduc. In addition, the provincial government provides funds for projects conducted at other institutions and in the private sector. The third major institution conducting agricultural research is the University of Alberta in Edmonton. The Alberta Research Council, a provincial government body carrying out research in a wide variety of areas in advanced science and technology, also undertakes some projects of value to agriculture. The three colleges of agriculture at Vermilion, Fairview and Olds also do some applied research and demonstrations, although these institutions are primarily devoted to agricultural education.

*Agriculture thrives on innovation.*





*It would be difficult to create and maintain a diversified and stable agricultural economy without agricultural research.*



Although the province has been able to adopt many innovations made elsewhere, it has often been necessary to tailor those advances to Alberta conditions. Occasionally a problem arises for which the needed research simply isn't available elsewhere. Scientists on the Canadian Prairies have combined their efforts to produce new varieties of crops with characteristics needed by Prairie farmers: early maturation, frost and drought tolerance, disease and pest resistance. A spectacular example was the development of the crop now known as canola, virtually a new species in terms of its potential uses and the feasibility of production on the Prairies. Canola varieties were developed by removing two naturally occurring chemicals from rapeseed. Canola is now a major oilseed crop in Canada, especially on the Prairies.

A second example of tailoring an existing life form to meet the particular needs of the province has been the development of the Alberta Bee, a hardy strain suited to foraging for honey under the cool conditions of northern Alberta and able to survive the winters. New livestock breeds have also been developed in Alberta. The Lacombe pig, a white breed with good carcass and growth characteristics, was bred at the Agriculture Canada research station in the central Alberta town after which the breed was named. The large variety of genetic stock in Alberta beef cattle has stimulated research on crossbreeding, the results of which are often economically advantageous because of the vigorous performance of genetically mixed stock.

Soil scientists in the province have devoted considerable energy to understanding the characteristics of and improving the productivity of the Gray Wooded soils which make up much of the province's land, especially uncultivated land still available for expansion of agriculture. Gray Wooded soils tend to be poor in texture and fertility and must be managed carefully if agricultural production from those soils is to be economically feasible.



# PART 2: AGRICULTURAL PRODUCTION IN ALBERTA

## Cereals and Oilseeds

**Wheat** Wheat is fairly drought-tolerant, will grow on a wide range of soil types, and responds well to fertilizer. Plant breeding has produced varieties with reduced days to maturity and improved resistance to diseases, pests, lodging (in which the stems buckle because of wind or rain and the plant lies flat) and shattering (loss of kernels from ripe heads).

Because wheat has a longer growing period and a higher minimum heat requirement than most other small grains, it is more suited to the southern areas of the province, although the very long summer days of northern Alberta enable wheat to mature in areas having less than the 110 frost-free days usually considered minimum. In southern Alberta drought in the spring and hot weather in the summer usually limits yields.

There are a number of different classes of wheat which grow well in different parts of the province.

— **Hard red spring wheat** has the widest distribution throughout the province because of the early-maturing varieties that have been developed, although the largest portion and best grades are grown in the south-central regions in the Dark Brown and Brown soil zones. It is the type of wheat which built Canada's high quality bread wheat reputation.

— **Hard red winter wheat**, grown mainly in the chinook belt in the southwest part of the province, requires milder winters because it is planted in the fall, but it is able to take advantage of early spring moisture and yields 10 to 15 per cent more than spring wheat. Improved management techniques used to increase winter survival are allowing winter wheat production to spread north and east. It is used mainly for cookies, biscuits and pastry flour, but new varieties and changing baking technology have enabled increased usage in bread making.

— **Durum wheat**, used mainly for pasta, is grown almost exclusively in southern Alberta where the growing season is long enough. Alberta Durum wheats make the highest quality pasta in the world.

— **Soft white spring wheat**, with higher yield potential and lower protein content than the others, is generally grown in the irrigated southern regions of Alberta. It is used mainly for livestock feed and pastry flour.

Prairie wheat is sold to export customers exclusively by the Canadian Wheat Board, a federal government agency. The Wheat Board also controls deliveries through quotas in an effort to match deliveries to demand, and establishes a pooled price so that all farmers producing a particular type of wheat receive the same price per unit regardless of the time of year sold. Grain is delivered by farmers to the country elevators that dot the Prairie landscape. The wheat is graded at the elevators and then shipped by rail to a port on the west coast or on the Great Lakes waterways system, from which it is exported. Most of Alberta's grain for export goes to the west coast.



Wheat



**Barley**

*About half of the barley produced in Alberta is fed to livestock.*

**Barley** About half of the barley produced in Alberta is fed to livestock as grain, silage, or high-moisture grain. A significant portion of it is fed on the farm where it was grown. The second major use for barley is malting. Outside of North America virtually all barley used for beer is two-row (two rows of kernels on each head). Within North America both six-row and two-row varieties are purchased for malt. Alberta barley is known around the world for its excellent malting quality. Maltsters have stringent standards: they prefer grain low in protein, high in carbohydrates, with good germination and free of disease and damage.

Barley has a short growing season and can therefore be grown throughout the province. It is more tolerant of salinity than other cereals but more sensitive to acidity; it is also a very efficient user of moisture. Of all the small grains, barley is the most responsive to soil fertility and good management.

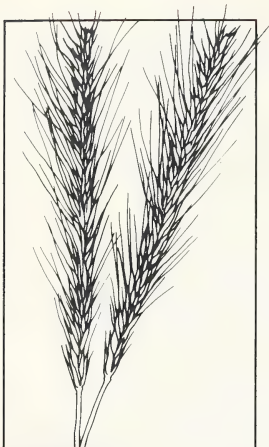
Barley can either be marketed as a cash crop to livestock feeders, fed on the farm where it was grown, sold to maltsters, or marketed through the elevator system to the Canadian Wheat Board. Alberta sells feed barley to other provinces. It is also an important export grain.



**Oats**

**Oats** Oats play a role as a cash crop in Alberta through the feed grain market. Eighty to 90 per cent is fed to livestock. A small amount is used for human consumption, mainly as rolled oats, oat bran and oatmeal. Oats will tolerate many different kinds of soil, including acid and poorly drained soils. However, they require more moisture than other small grains and are prone to heat damage and lodging. They do best in the cool, moist climate of west-central and north-central Alberta as well as parts of the Peace River region. Recently the demand for Alberta oats for high performance racehorse feed has increased greatly.





Rye

**Rye** Most of the rye grown in Alberta is the fall-planted type, grown mainly in southern Alberta where it is often used as pasture for livestock in the early spring, summer and late fall; it also protects the land from wind erosion during the winter. Rye is noted for its ability to produce on light poor soil. Fall rye is more resistant to winterkill than winter wheat. Rye as a grain is used in Alberta mainly for animal feed; other uses are bread flour and whiskey. About half of Alberta rye production is exported. It is not marketed by the Canadian Wheat Board and most is sold on the open market, prices being established at the Winnipeg Commodity Exchange. A major drawback of rye is its susceptibility to ergot, a fungal disease, which is poisonous to human beings and animals.

**Canola** The important Prairie crop that is now known as canola was not even grown on the Prairies until 1943. "Rapeseed", as the forerunner to today's canola was called, was then used as a lubricant for warship engines. The early rapeseed varieties contained two compounds, erucic acid and glucosinolates, which reduced their suitability for human and animal consumption. Canadian plant breeders subsequently developed new varieties low in both of these compounds; because of this important change in the plant's characteristics the name was changed to canola.

It is now used primarily as an oil for human consumption. More than one-third of the margarine, almost half of the shortening and three-quarters of the salad oil manufactured in Canada is made from canola. In addition, the seed and oil are important export commodities. The meal, a byproduct of the oil crushing process, is used as a protein supplement in livestock rations, particularly for poultry, swine and dairy cattle.

Canola production is most suited to medium textured soils such as loams, clay-loams and silty clay loams because they have good water holding capacity, allow moisture infiltration and have adequate drainage. Most agricultural soils in Alberta fall within these textural classes. In Alberta, the main canola growing areas are the Parkland belt of central Alberta and the Peace River region. Two species of canola are grown in Alberta. *Brassica napus* (Argentine type) varieties are later maturing and more suitable to the longer growing season areas, while *Brassica campestris* (Polish type) varieties are earlier maturing and can be grown in all areas. Canola is a poor weed competitor in the seedling stage and is subject to many diseases and insect pests. Proper management of the crop is essential to obtain high yields.



Canola



Flax

**Flax** Flax is grown either for oil or fibre; oilseed flax is the type grown in Alberta. Linseed oil extracted from the flax is used in protective coatings for wood. The flax grown in Alberta has a reputation for yielding very high quality linseed oil which dries quickly, a trait of flax grown in a cool climate.

Flax does well in areas suitable for wheat as it requires a similar frost-free season. Flax can also be grown in the Peace River region because the long days hasten maturity. Flax grows best on heavy loam soils that retain moisture well for the plant's limited root system. In the past, poor flax yields were generally the result of drought and weed competition. Today, most broadleaf and grassy weeds including volunteer cereals can be controlled in flax with herbicides.

**Special Crops** Special crop producers concentrate on approximately 12 crop kinds from year to year. Production takes place throughout the province where annual crops are grown. The province has three distinct zones that are individually suited to different species of the 12 crop kinds.

Southern Alberta receives more heat units (CHU's) than the rest of the province. Producers there can concentrate on special crops that require additional heat and longer days to mature. Dry bean, grain corn, sugar beet, sunflower, safflower, mustard, spices and essential oil crops are the crops of prominence in southern Alberta. Field pea, fababean and lentil crops are also grown on smaller acreages in southern Alberta. Irrigation in the south also provides a valuable compliment to the production of special crops. Increased returns are realized from these crops because of the added water.

Dryland areas of south and east central Alberta, where moisture is a limiting crop production factor but where growing days are longer than those of the Parkland zone, are suited to lentil, safflower, mustard and sunflower production. Although the acreages of these crops in these areas are small, they do provide valuable cash returns.

The Parkland and Peace River areas of Alberta are characterized by cooler, wetter growing seasons and are ideally suited to production of cool season moisture-loving special crops. Field pea, fababean, lentil, canaryseed, and buckwheat are crops that are successfully produced in this area of the province.

Special crop production has come of age in Alberta over the past four years. Acreages continue to increase despite yearly price fluctuations. During the early 80's, special crop acreage, in many cases, was tied to the dollar value of the crop. Dedication to the crops is presently very strong, not solely for higher net returns, but for other realized valuable attributes.



Safflower



Soil conservation and rebuilding programs are underway with producers who are growing pulse or grain legumes. Pulse growers realize the benefit of the annual legume as a break crop in cereal and oilseed rotations. Annual legume production is assisting in eliminating some summerfallow acres in Alberta. Field pea and fababean production is beginning to provide a home grown protein for livestock feeding. Many livestock feeders support domestic protein production and usage and wish to curtail expenditures for imported soymeal. A high protein, dairy quality silage is also being produced with field peas and fababeans.

Safflower is of particular interest to southern Alberta growers because of its potential to control soil salinity. Safflower has a long tap root that can pull water from irrigation recharge areas.

Canaryseed and buckwheat benefit some cereal and pulse growers as a break crop for disease control and for decreasing abundant soil nitrates.

*The suitability of peas to Alberta growing conditions and their nutritional characteristics, make them the legume with the greatest potential to replace imported soybeans as a protein source in feed.*



## Forage Crops

**F**orage crops include annual and perennial legumes and grasses. Legumes, which have thick tap roots that penetrate deeply into the soil, produce a high protein feed and add nitrogen to the soil, thereby increasing the soil's fertility. For that reason they are an excellent addition to a crop rotation, especially on the less fertile Gray Wooded soils. Legume species most used in Alberta include alfalfa, red clover, alsike clover and sweet-clover. Grass species most used include brome grass, crested wheat grass, timothy and creeping red fescue. Grasses have fibrous roots which add to the organic content of the soil and prevent wind and water erosion. Grasses often withstand extreme climatic and soil conditions and are long-lived. Seeded pastures typically contain at least half grass, a combination that reduces the bloat problems in livestock commonly associated with a legume-rich unprocessed feed.

Alfalfa is grown extensively on irrigated lands in southern Alberta, where the added water produces large volumes of forage, yielding up to three harvests or "cuttings" during the growing season. Brome grass and orchard grass are common in irrigated lands, especially in combination with alfalfa.

An alfalfa/brome grass mixture is the most commonly grown tame hay crop in the Black soil zone of central Alberta, where the soil and climate support a large livestock population and the province's largest concentration of tame hay.

In the Brown soil zone of southeastern Alberta drought-resistant species such as crested wheat grass and the wild ryes are used, especially in combination with alfalfa. In the Gray Wooded soil zone grasses such as timothy, brome and creeping red fescue are used in combination with alfalfa, alsike and red clover.

Baling of sun-cured hay is still the most common method of preserving forage crops. Large round bales have replaced small square bales in most haying operations. Silage is increasingly popular with beef cattle producers, and has been a mainstay of the dairy industry for many years. Silage uses forage of higher moisture content and preserves it through fermentation. Several processing plants in Alberta dehydrate alfalfa and form it into pellets or cubes. Densified hay bales are made by compacting regular small square bales into compact bales for efficient transport.

*Several processing plants in Alberta dehydrate alfalfa and form it into pellets.*





*Large round bales have replaced small square bales in most haying operations.*



Native and tame pasture constitutes a major source of ruminant feed, during the summer months. Pastures must be carefully managed so that the livestock does not damage the forage stand by over-grazing. Annual pasture is commonly planted, especially for spring and fall grazing. Fall rye and winter wheat are popular annual pasture.

A specialized form of forage crop production is the growing of pedigree forage seed. Alberta farmers produce over half of Canada's alfalfa, alsike clover, red clover, crested wheat grass, creeping red fescue and pubescent wheat grass seed supplies. Brome grass is also commonly grown for seed. Seed production is concentrated in the Peace River region.

## Livestock and Poultry

**Beef Cattle** The popular image of Alberta's beef industry is one of sprawling ranches in the foothills of southern Alberta. Although that is where beef production began in Alberta more than a century ago, it has since spread throughout the province. The raising of cows and calves in particular, once concentrated in the ranching areas, has increased more rapidly in central and northern Alberta. The cattle feeding industry, which takes weaned calves and raises them to market weight, has shifted toward south-central and southern Alberta. This shift has occurred primarily because the major markets for finished cattle are located in the Calgary and Lethbridge areas.

Of those Alberta farms that raise cattle, one-third have fewer than 35 head. This is a continuation of the production system developed in past years where farmers who relied primarily on grain for their income fed cattle to maintain farm income through periods of low grain prices, poor grain markets, and natural disasters such as frost and hail. The cattle also made use of land that was too poor to cultivate but could be used for grazing. Over the past two decades, however, more operations have developed that rely heavily or entirely on livestock for their income. Many commercial feedlots have also sprung up, purchasing their feed and feeder cattle or custom-feeding someone else's cattle for a fee. These highly mechanized high-volume operations currently account for the major portion of slaughter cattle production in the province.

*The most important single resource needed for beef production is a land base suited to growing forage and feed grains. Alberta has such a land base.*





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The most important single resource needed for beef production is a land base suited to growing forage and feed grains. Alberta has such a land base. Even though significant expansion has taken place in the Gray Wooded soil zone during the past 20 years, there is still a potential for a considerable increase in Alberta's beef production. Whether this will occur depends on general economic conditions for farmers, world demand for grains as food, and the ability of Alberta beef producers to access other markets, especially in the western United States and Pacific Rim countries.

Meat processing is a large industry in Alberta, with more people employed in livestock and poultry processing than in any other segment of the food and beverage industry. Besides beef, cattle provide many byproducts ranging from hides and feed components to pharmaceutical products such as insulin.

A specialized part of the beef industry is the production of pedigreed or purebred breeding stock. Over the past 20 years Alberta breeders have assembled the largest and most varied genetic pool of beef breeding stock to be found anywhere in the world. There is a strong demand for Alberta breeding stock and genetic material such as semen and embryos. The breeding industry until a generation ago relied almost exclusively on three British breeds: Herefords, Aberdeen Angus and Shorthorns. The past 20 years have seen the successful addition of breeds from continental Europe: Charolais, Limousin, Maine-Anjou and Blonde d'Aquitaine from France; Simmental from Switzerland; Gelbvieh from Germany; Pinzgauer from Austria; Chianina, Romagnola and Marchigiana from Italy.

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**Dairy Cattle** Dairy production, as other types of farming, has become highly specialized and mechanized. Quality standards are very high, with rigid inspection programs covering every phase from the health of the cow through to the finished product at the dairy. A majority of dairy herds in Alberta are comprised of Holsteins, known for their high milk production. Other dairy breeds in the province include Ayrshire, Brown Swiss, Guernsey and Jersey. With modern management methods, performance testing and rigorous breeding standards, average production has increased dramatically. The average cow currently produces about 7,000 litres of milk per year. A reputation for high quality has led to improving direct cattle sales throughout the world as well as significant world markets for semen and embryos from Alberta dairy cattle.

A majority of dairy producers use artificial insemination to maximize genetic gain. Technological advances such as embryo transfer, embryo splitting, and semen sexing will continue to provide for further genetic improvements.

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About 45 per cent of Alberta's milk is sold for fluid consumption, and commands the highest price. More than half of milk and cream production is sold for the manufacture of other dairy products such as butter, cottage cheese, ice cream, yogurt and cheese. More than 25 kinds of cheese are made in cheese factories throughout the province; the most popular type is cheddar.

Most of Alberta's dairy production is concentrated between the major urban centres of Edmonton and Calgary in the Black and Gray Wooded soil zones. Significant development has also occurred in recent years in the southern irrigation area where there is an abundance of high quality feed. Fluid milk quotas insure that there is an adequate supply of fresh milk produced throughout the year. Nationally, the dairy industry is "supply managed" through a marketing plan that regulates supplies and establishes prices for industrial milk used in the manufacture of dairy products. This marketing scheme has brought stability to the dairy industry in Alberta.

*Today, an average cow produces about 7,000 litres of milk a year.*



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**Sheep** Soil and climatic conditions in Alberta favor sheep production; sheep are especially suited to grazing on poorer land and consuming lower quality feeds. Approximately 55 per cent of the sheep production in Alberta occurs in southern Alberta (south of Innisfail/Coronation) where an abundance of native rangeland exists. Elsewhere, production occurs in the central and Peace River regions. Most Alberta sheep producers keep their sheep on range, although there are some semi-confinement systems which use feedlots in winter and pasture in summer. Alberta sheep are mainly of the meat producing type, as the market and prices for wool are not attractive. The most popular breeds are Suffolk and Rambouillet.



**Swine** More than 60 per cent of Alberta's hogs come from the nine per cent of producers who produce 1,000 or more market hogs annually. These farms feature confined housing in climate-controlled barns, highly mechanized operations and a small land base. The hog industry constitutes a major market for Alberta feed barley producers.

Because the major component of hog feed is barley, the principal hog production region corresponds with the best barley producing area: the Black soil zone from just north of Edmonton to just south of Red Deer. The second major region is around Lethbridge. Hog production is lower in the Peace River region, partly because of distance from markets.

Alberta has high quality swine breeding stock selected for rapid growth and leanness, as well as many herds with minimal disease or high health status. Access to the province's breeding stock is aided by the Swine Artificial Insemination Centre near Edmonton. The "white" breeds are the most popular in Alberta. Yorkshires make up the largest number followed by Landrace. The Lacombe breed, developed at Lacombe, Alberta, is also available in small numbers. There are also smaller numbers of breeds such as Hampshires and Duroc Jerseys.

*The hog industry constitutes a major market for Alberta feed barley producers.*



**Poultry** Poultry production has changed radically from the traditional small flock running loose in the farmyard, to a system where the majority of production is produced in large, modern, confined facilities. Consequently, the number of farms with poultry has decreased but production per farm has increased. The average size of an egg-laying operation is approximately 6,000 hens, while broiler chicken producers have an average of 25,000 birds on a nine-week quota cycle.

Unlike red meats, poultry meat consumption has increased in Canada in the past two decades, from 14.8 kilograms per capita in 1963 to 28.7 kilograms in 1988. The main increase has been in the consumption of broiler chickens; as a consequence there has been a 127 per cent increase in the production of chicken between 1973 and 1988.

Most egg layers are Leghorns, white chickens which produce white eggs. Production of eggs is scattered over the entire province. There has recently developed a small market for brown eggs. Broiler production is concentrated near Lethbridge, Calgary and Edmonton. Twelve commercial hatcheries supply the industry.

The production and marketing of eggs, chicken, turkeys and hatching eggs is regulated by marketing boards; Alberta belongs to national marketing agencies for eggs, broiler chickens, turkeys and hatching eggs. Under this system each province is allocated a provincial quota to cover its production. Egg production in Alberta is insufficient to cover demand and eggs are brought in from Manitoba. Because poultry production costs are higher in Canada, there is very little export. However, improved breeding and management have kept production costs low enough that Alberta poultry producers can compete in their own market, with other types of meat and with poultry imports from outside Alberta.

*Production of eggs is scattered over the entire province. The average size of an egg-laying operation is about 6,000 hens.*





**Horses** During the past two decades the production of horses has become a significant activity in Alberta's agricultural economy. There are more than 160,000 horses in Alberta, about double the number to which they had dropped when mechanization took over the horse's duties in farm work and transportation. Although the horse is still used in ranch country by working cowboys, horses in Alberta are raised overwhelmingly for recreational use.

Because of the early dependence on horses in ranching and agriculture, Alberta has developed a long tradition of producing good horses. The production of high quality purebreds is the part of the industry in which there is the most demand, and Alberta raises the largest number of pedigreed horses of any province. About one-third of the horses registered in Canada every year are from Alberta. Estimated return from the sale of registered horses in Alberta was \$15.3 million in 1988.

By far the most popular breed is the Quarter Horse, the traditional working horse of cattle country, now used mainly as a show and leisure riding horse. About half the Quarter Horses registered in Canada yearly are from Alberta. Arabians are the second most popular pleasure breed, with Alberta producing more Arabians than any other province. In the category of racehorses, Alberta breeders produce Thoroughbreds for flat racing, and Standardbreds for the sport of harness racing which has shown large gains in popularity. About 1,200 Thoroughbreds and 600 Standardbreds are required for Alberta tracks every year. The third major category is the draft horse, now used almost exclusively for show. Alberta breeders raise some of the best Belgian, Percheron and Clydesdale horses in North America.

Although Canadians generally do not eat horsemeat, there is demand for the product in Europe and Japan. In 1988, the total value of horse meat exports out-of-country was \$41.5 million.

*Alberta has developed a long tradition of producing good horses.*



# Horticulture

## Vegetables

Although vegetable production has grown modestly in recent years Alberta is, by a large margin, a net importer of horticultural products except for potatoes and mushrooms. Enough potatoes are grown in the province to meet much of Alberta's annual consumption requirements. Alberta carrots account for about 30 per cent of total provincial consumption; cucumbers, about 30 per cent and hothouse tomatoes, about half.

The southern portion of the province is a prime site for production of warm season vegetables because of the high summer temperatures and long growing season. Irrigation is necessary. The central Alberta area in the Black soil zone is better suited for the production of cool season crops such as potatoes, carrots and cabbages, but some irrigation is desirable. Some areas of the Peace River region, particularly river valleys protected from frosts, are good for cool season crops such as cabbage and carrots because of the long summer days and micro-climatic conditions.

The Alberta potato industry generated farm receipts worth about \$40 million in 1989. More than 200 farmers plant over 23,000 acres producing 250,000 tonnes or more annually. More than 60 per cent of the crop is used by the province's five processing plants for such products as frozen French fries and potato chips. The province also has a disease-free seed program, guaranteeing high quality seed potatoes. Alberta's high altitude and temperate climate are ideal for growing potatoes; as a result Alberta potatoes have a high dry-matter content and good nutritional and cooking characteristics.

The seed potato industry is relatively small involving plantings of 4,000 acres annually. However, revenues generated were in excess of \$7 million in 1988-89. About one-third of Alberta's seed production is exported to the United States. These export sales have steadily increased to 17,223 tonnes and are expected to continue increasing.

The commercial vegetable industry in Alberta is divided roughly into two sectors, fresh and processed. Fresh vegetable production in 1989 approached 3,300 acres of primarily storage vegetables which include carrots, cabbage, cooking onions and rutabaga. These storage crops present the greatest potential which is restricted by a shortage of costly storage and handling facilities. More perishable vegetables grown include field cucumbers, cauliflower, Chinese vegetables, broccoli and pumpkin/squash. Sweet corn largely produced in southern Alberta finds markets throughout the entire province. Marketing of all fresh vegetables is one major factor inhibiting expansion of fresh vegetable production. Processing vegetables which include peas, snap beans, corn, carrots and red beets are produced by contract exclusively in southern Alberta. There were 6,300 acres of processed vegetables under contract in 1989.

Another large sector of fresh vegetable production in Alberta is market gardening. Market gardening, the production and selling of vegetables and small fruits directly to the consumer either at the farm gate or through Alberta's more than 100 farmers' markets, has steadily increased. More than 300 market gardeners are spread throughout Alberta, with gardens ranging from one to 25 acres. Vegetables and small fruits such as strawberries, raspberries and saskatoons are produced. An estimated 2,600 acres are devoted to market gardening. Strawberry production has increased significantly.



## Commercial Nurseries

The production of trees and shrubs has remained fairly constant during the last 10 years with about 3,700 acres in production. There are about 1,700 permanent employees in these nurseries which are located throughout the province.

Recent developments include the propagation of their own plants from seed, cuttings or budding and grafting. This has resulted in the Alberta share of the market rising from 14.7 per cent in 1984 to 25 per cent in 1988. Container growing has increased from very little 10 years ago to about 25 acres in 1989. One acre of containers has a retail value of just over \$800,000. Plants grown in containers can be transplanted anytime during the growing season and do not suffer the transplant shock that bareroot or tree spaded material experience.

## Commercial Greenhouses

There are currently about 300 commercial greenhouses in operation with an area of 148 acres. These greenhouses employ approximately 1,200 full time people and generate a gross revenue of over \$40 million. The

major concentration of greenhouses is around the cities of Edmonton, Calgary, Medicine Hat and Lethbridge.

There are four types of greenhouse operations. Most of them produce bedding and potted plants. The second largest group raise vegetables like seedless cucumbers, tomatoes and lettuce. The third type are involved in different types of cut flowers like roses, chrysanthemums, lilies, freesias and foliage plants. The fourth group produce tree seedlings, rooted cuttings and pre-finished potted crops and seedlings.

*There are about 300 commercial greenhouses operating in Alberta.*



# Beekeeping

**A**lberta honey is light-colored and has a delicate, subtle flavor desired by both domestic and foreign markets for consumption and use. Alberta produces approximately 30 per cent of Canada's honey. Forty per cent of Alberta's honey comes from the Peace River region, where the long summer daylight hours and abundance of forage and canola crops as nectar services result in high honey yields per colony; 200 to 250 pounds of honey per colony is not uncommon. The Peace River region also has some large volume honey operations — many are 1,000 colonies or more.

Commercial beekeepers — those with at least 300 hives who derive all or most of their income from beekeeping — comprise 11 per cent of Alberta's beekeepers, the balance of the total being classified as "side-liners" or hobbyists.

Honey bees rely on nectar and pollen sources such as dandelions and willows earlier in the gathering season, gathering surplus amounts from canola, clovers, alfalfa and fireweed at the height of the summer months. A surplus of pollen can be collected by beekeepers using specially designed traps. In the Peace River region, pollen, which is collected and dried for human consumption, has become a "second crop" for some beekeepers. Bees also make a major economic contribution through cross-pollination of forage seed crops and canola.

Beekeepers in Alberta are keeping their bees through the winter, using either indoor and/or outdoor management methods. Package purchases from the United States supplemented colony numbers in previous years. However, with the discovery of parasitic mites the importation of U.S. bees was not allowed. Alternate sources of replacement bees and queens will likely come from British Columbia, New Zealand and Australia which are pest-free sources. Now Alberta producers are being encouraged more than ever to become less reliant on outside sources for their bee requirements. The Alberta bee stock, developed at Beaverlodge Research Station and Fairview College (distributor), will prove to be a valuable aid in developing this self-reliance within the industry.

Most commercial beekeepers sell their honey in bulk through their own co-operative or to private packers domestically and to brokerage firms for export sales. Some, particularly hobbyists, pack and sell their nonbrands directly to the consumer at farmers' markets, retail outlets or at the farm gate.

About 60 per cent of Alberta's honey crop is exported interprovincially and internationally. Exports to the U.S. — our primary customers until recently — have declined sharply forcing producers to find alternative world markets themselves or through government programs. There is a general world surplus of honey and competition for markets is fierce.

Approximately four to five million pounds of honey is consumed within Alberta. This equals the national per capita consumption of nearly two pounds, one of the highest in the world.



# SUGGESTIONS FOR FURTHER READING

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The following books and reports are available through your local library or bookstore or may be ordered by writing directly to the address indicated.

**Agricultural Considerations for Today and Tomorrow**, prepared by Rural Environmental Sub-Committee of the Public Advisory Committees to the Environment Council of Alberta. Edmonton, AB: The Council, 1988. Available from the Environment Council of Alberta, 8th Floor, Weber Centre, 5555 Calgary Trail South, Edmonton, AB T6H 5P9.

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